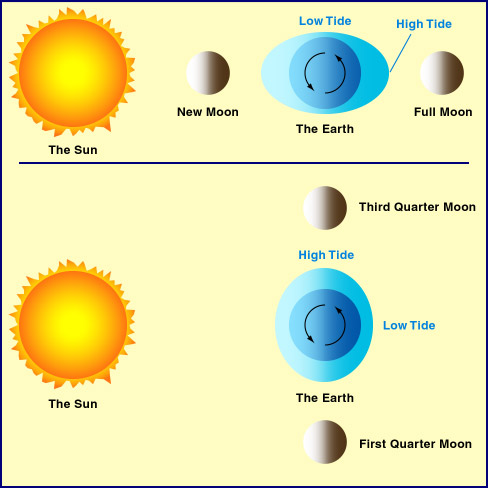
* Tides refer to regular changes in the elevation or depth of areas within Earth’s ocean waters caused by the gravitational pull of the moon and the sun.
* Water in Earth’s oceans flows toward the Moon and forms a bulge.
* The Sun also creates tidal effects, but since the Sun is so much further away it doesn’t pull on Earth’s ocean waters with as much force as the moon (46% less)
* Two tidal bulges (areas of high tide) are created along the Earth-Moon line as the moon first pulls on the nearside ocean waters, and then also pulls the solid Earth away from the farside ocean waters.
* Because the Earth rotates much faster than the moon revolves, positions on Earth are carried through the two tidal bulges (areas of high tide) and the two areas of low tide. Thus it is incorrect to say “the tide is coming in or going out” since we are actually rotating through deeper or shallower parts of Earth’s ocean.
* Tidal forces are strongest at New and Full Moon, when the gravitational pull from the Sun and Moon combine to create extreme high/low tides. These extreme tides are known as Spring Tides.
* During the quarter moon phases, the tidal forces of the Sun and Moon partially cancel each other – creating mild tides called Neap Tides.
* Land tides also occur, but the changes in elevation of land on Earth are imperceptible to us (< 8 inches/day). However, some places in our solar system experience extreme land tides, like on Io. Io is one of Jupiter’s moons where the solid ground shifts more than 30 stories each day! That’s over 300 ft.!
* Tidal forces are responsible for lengthening Earth’s period of rotation (slowing Earth down), creating synchronous rotation and increasing the size of the moon’s orbit around Earth. The moon is moving away from Earth at a rate of a centimeters/year.